Intergraph Asia Pacific 2008
Process Power & Marine

SmartPlant Process Engineering

Intergraph Australia 2008
15-19 September 2008
Challenges

- Design for required product capacity with minimum cost on CAPEX and OPEX
- Manage various design scenarios
- Fast-track projects to take advantage of market window
- Feed into detailed design
- Create deliverables
- Enable clients to review options and costs
- Manage the change
- Manage the operational phase, equipment upgrades, replacements, feed stock changes, production monitoring, etc.
FEED Impact on Project Cost

Cost reduction opportunity

Source: The Chemical Engineer 1996
Intergraph Products Scope

Process, Power & Marine

Front End Engineering Design
Detailed Engineering Design
Fabrication & Construction
Operation & Maintenance

Process Engineering
Process Engineering
SmartPlant Enterprise Extension

- SPE Integrated solution for plant life cycle
- Flexible and extendable
- Partner program key element of the Enterprise
- Process Design foundation for Design and Operations
- UNISIM for process design
- Market request options and simulation solutions fit for industry segments
  - Chemicals
  - Oil and gas
  - Power
  - Pharma (batch)
Process Design

Process Scope

- Process Model
  - Unit Operation
  - Streams
  - Unit Operation
  - Controls
- Case Studies Documentation
  - Cases/Documents (reports, PFD, Revisions)
    - Equipment Data Sheets
    - Piping & Instrumentation Diagram (P&ID)
    - Control System
    - Power Distribution
Case Management = Data Management

- Huge amount of data to be managed
- SmartPlant Technology a perfect fit
The Vision

- Offer a flexible and configurable plant engineering solution supporting the plant life cycle for various industry segments in the process, power and marine segments
- Enable customers to use process design solution fit for purpose and industry
- Provide seamless interface to the design tasks through SP Enterprise
- Offer value-added work processes that lower CAPEX and OPEX cost and the risk of operating a plant
- Extend the solution with engineering solutions from market-leading and/or innovating companies.
SPF Architecture Concepts

- **Simulation Domain**
  - To store all simulation data: Inputs, Outputs, Cases,…

- **Process Design Workbench (Domain)**
  - To select data from the Simulation Domain and develop the process design envelope

- **Publish Domain**
  - To release process design data to the rest of the project
Simulation Domain

- Store Simulation Run Data
  - Streams
  - Unit Operations
- View Only
- Drill Down
- Lists
- Comparison Reports
Retrieve from Simulation Domain into Process Design

- Plant
- Streams
- Operations
- Cases
- Phases
- Components

- Project
- Equipment
- Cases
- Phases
- Components
Process Design Domain

- Plant
  - Project
    - Streams
      - Cases
      - Phases
      - Components
    - Equipment
      - Cases

PFD

Excel
HDA Process Flowsheet

- Hydrogen
- Toluene
- Benzene
- Biphenyl
- Compressor
- Furnace
- Reactor
- Flash Drum
- Stabiliser Column
- Hydrogen Methane
- Toluene Column
- Benzene Column
- Stabiliser Column
## Stream Data

### Case Comparison

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Correlating the function with the plant items

![Image of a software interface titled "Update Design - Separation Section (NormalOperating)"

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<tr>
<th>Item</th>
<th>Type</th>
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<th>Engineering Item</th>
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New | Changed | Deleted | Unchanged
HDA - Process Flow Diagram (PFD)

Stream        101  102  103  104  105  106  107  108  109  110
Temperature
Pressure
Hydrogen
Methane
Benzene
Toluene
BiPhenyl
Value

Preliminary 3D Plant Layout Benefits  Process, Power & Marine

- Speed & quality improvements compared to manually drafted layouts;
  - Improved preliminary designs
  - Increased estimate accuracy based on actual layout
  - Higher Quality Proposals

  leading to …

- 10% reduction in concept development man-hours
- 90% reduction in material estimate man-hours
- 10-20% reduction in detailed design man-hours
- 5-10% reduction in total plant installed cost
- Reduction in materials requirements

SmartPlant Layout – Design Layout (Case) Alternatives

CASE 10
2320 ton

CASE 12
2210 ton

CASE 13
2130 ton
UniSim® Design Suite

Fast Track from Conceptual to Detailed Design

AspenTech Icarus Cost Estimating

Mechanical Data Sheets

SmartPlant Layout